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Anaesthesia has always been compared to aviation industry, where even a small error of judgement could lead to a critical incident. This demands an exceptional level of skills and vigilance similar to aviation [1]. With an ever increasing complexity of surgeries and rapidly evolving science and newer drugs, safety is always on the demand mode. Hence akin to simulation in aviation training, anaesthesia as a specialty has remained in forefront in using simulation for training [1]. Patients are becoming increasingly concerned that students and residents are practising on them. Clinical medicine is becoming focused more on patient safety than on bedside teaching and evaluation. These challenges have been overcome by curriculum restructuring, small group sessions and self-directed learning with independent research. However disconnect still exists between classroom and the clinical environment. Medical simulation has been thus proposed as a technique to bridge this educational gap. Simulation is best defined as an instructional process by David Gaba

## Role of simulation in anaesthesia

MD. It is being defined as a technique not technology that replaces or amplifies real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner.

History of simulation has gone a long way in evolution. It dates back to 1920's to development of anatomy laboratory by John Lundy at Mayo Clinic. Then came "RESUSCI ANNE" which was joint development by Peter Safar an anaesthesiologist and intensivist and Bjorn Lind along with Laerdal, a toy manufacturer by profession. There was no looking back after that and many more like SIM one, GAS etc. came into picture. These simulators were instrumental in the development of anaesthesia patient safety foundation (APSF). Later Dr Gaba adopted crew resource management in anaesthesia and called it Anaesthesia Crisis Resource Management (ACRM).

Multicentric studies show the initial learning curve for many procedures can be shortened, especially for beginners using simulation training [3]. Deliberate and repeated practice involved here is viewed as a strategy to help the student work through Millers domain of competence knows (knowledge), knows how (competence), shows how (performance), does (action) [3]. These follow the concept of adult learning which is mainly active learning and self-directed. It allows debriefing sessions at the end of exercise that allows for reflective learning as well [3]. Simulation has led to clinical improvement in mainly two areas of research. Surgical simulators for laparoscopic surgery are an excellent example. Residents trained on simulators in Advance Cardiac Life Support are more likely to adhere to protocols [2]. Multiple studies have demonstrated the effectiveness of stimulation in the teaching of basic sciences and critical

knowledge, procedural skills, team work and communication.

Medical schools and residency programs have began to incorporate the use of simulation in educational and certification processes. Various boards such as USMLE, Canadian board certification, American board of Family Practise, Israeli board, RCOA fellowships (FRCA) exams have incorporated simulation based scenarios to assess the trainees. Finally the use of simulation has a significant growing impact on medical malpractice insurance for the anaesthesiologist.

Nevertheless inspite of the above mentioned advantages many multicentric studies have pointed out the limitation of this technique. There is little evidence that its use improves the patient outcome [4]. Another criticism is the extent to which a simulator can reproduce the real life situations. Rai and Popat have pointed out dearth of patient based studies following mannequin based ones.

However compared with no intervention, simulation based anaesthesiology training was associated with large, statistically significant positive effects for most outcomes [4]. Compared with non simulation instruction small effects for satisfaction, knowledge and skill and large effects on behaviour have been observed.

Future application of simulation in anaesthesia depends on the commitment and ingenuity of healthcare simulation to see that improved patient safety using this tool may be a reality [6]. David Gaba further added "no industry in which human life depend on skilled performance of responsible operators has waited for unequivocal proof of the benefit of simulation before embracing it. No Conflicting interests.

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Conflict of Interest: Nil  
Source of Support: None

### How to Cite this Article

Lande-Marghade P. Role of simulation in anaesthesia. Journal of Anaesthesia and Critical Care Case Reports Oct-Dec 2015; 1(2):1-2.